

CLAIMS:

1. Method of sending additional information in a signal (y) having media content comprising the steps of:
mapping the amplitude values of the media content (x) onto first new values using a first mapping function (C_Q), (step 28), and
5 inserting the additional information (O, D) into the mapped media content (x_Q), (step 36).
2. Method according to claim 1, wherein the first mapping function creates at least one hole in the amplitude values of the mapped media content to be used for embedding
10 additional information.
3. Method according to claim 2, wherein the step of inserting additional information comprises using said at least one hole and a corresponding value of the mapped media content for embedding additional data.
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4. Method according to claim 1, wherein the step of mapping includes allowing the use of one first new value of the media content to correspond to more than one unmapped value of the original media content and further comprising the steps of:
mapping the first new values of the media content (x_Q) onto second new
20 values using a second mapping function (E_Q), (step 30), and
generating an error signal (q) comprising the difference between the second new values of the media content (x_E) and the original media content (x), (step 32), and sending the error signal (q) to the receiver.
- 25 5. Method according to claim 4, further including the step of compressing the error signal (step 34).
6. Method according to claim 4, further comprising the step of sending the media content (x_Q) that has been mapped using the first mapping function together with the

additional information (O, D) to a receiver (12), (step 38), wherein the error signal is included in the media content sent to the receiver.

7. Method according to claim 4, further comprising the steps of sending the
5 media content (x_Q) that has been mapped using the first mapping function together with the additional information (O, D) to a receiver (12), (step 38), and sending information about first and/or second mapping function used to the receiver.

8. Method according to claim 7, wherein the information about second mapping
10 function used is included in the media content sent to the receiver.

9. Method according to claim 1, further including the step of selecting a first
mapping function among at least two first mapping functions and performing the step of
mapping using the selected function for at least a part of the media content.

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10. Method according to claim 9, wherein the step of selecting is performed in
dependence of properties of the media content.

11. Method according to claim 9, further including the steps of:
20 selecting a second mapping function among at least two second mapping functions, mapping the first new values of the amplitude of the media content using the second mapping function onto second new values for parts of the media content mapped according to the selected first mapping function, and

generating an error signal comprising the difference between the second
25 mapped media content and the original media content for the selected first and second mapping functions,.

12. Method of receiving additional information in a signal having media content,
comprising the steps of:

30 receiving a signal (y) including media content (x_Q) the amplitude values of which have been mapped onto first new values using a first mapping function (C_Q) together with embedded additional information (O, D), (step 40), and
removing the additional information (O,D) from the media content, (step 42).

13. Method according to claim 12, further including the step of processing the additional information.
14. Method according to claim 12, further including the step of mapping the
5 amplitude of the received first new values of the media content onto second new values using a second mapping function (E_Q), (step 44).
15. Method according to claim 14, further including the steps of receiving an error
10 signal (q) corresponding to an error between the original media content (x) and media content (x_E) mapped with the second mapping function (E_Q) and adjusting the media content mapped using the second mapping function (E_Q) with the error signal, (step 48).
16. Method according to claim 14, further including the step of receiving first or
15 second mapping function information and applying a second mapping function according to this information on at least parts of the received media content.
17. Device (10) providing additional information in a signal having media content,
comprising:
a first mapping unit (14) arranged to map the amplitude values of the media
20 content (x) onto first new values using a first mapping function (C_q), and
a multiplexing unit (16) for inserting the additional information (O, D) into the mapped media content.
18. Device according to claim 17, wherein the first mapping unit is arranged to
25 create at least one hole in the amplitude values of the mapped media content to be used for embedding additional information.
19. Device according to claim 18, wherein the multiplexing unit is arranged to use
30 said at least one hole and a corresponding value of the mapped media content for embedding additional data.
20. Device according to claim 17, further comprising a second mapping unit (18)
arranged to map the first new values of the media content (x_Q) onto second new values using a second mapping function (E_Q) and a subtracting unit (19) arranged to subtract the original

media (x) content from the second new values of the media content (x_E) for providing an error signal (q).

21. Device according to claim 20, wherein the multiplexing unit (16) is arranged
5 to insert the error signal in the first new values of the media content.

22. Device according to claim 17, wherein there are at least two mapping units
(14, 54) performing two different first mapping functions and furthermore comprising a first
switch (58) arranged to connect the original media content to either one of the first mapping
10 units.

23. Device according to claim 22, further comprising at least two mapping units
(18, 60) performing two different second mapping functions and each arranged to map first
new values of the media content (x_Q) onto second new values, a subtracting unit (19)
15 arranged to subtract original media content (x) from second new values of the media content
(x_E) for providing an error signal (q), a further switch (62) arranged to connect the first new
values of the media content to either one of the mapping units performing a second mapping
function and yet a further switch (64) arranged to connect either one of the mapping units
performing a second mapping function to the subtracting unit.

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24. Device (12) for receiving additional information (O, D) in a signal (y) having
media content, comprising:
a demultiplexing unit (22) arranged to:
receive a signal (y) including media content the amplitude values (x) of which
25 have been mapped onto first new values (x_Q) using a first mapping function (C_Q) together
with embedded additional information (O, D), and
remove the additional information from the media content.

25. Device according to claim 24, further comprising:
30 an third mapping unit (24) arranged to map the the first new values of the received media
content to second new values using a second mapping function (E_Q).

26. Device according to claim 25, further comprising an adding unit (27) arranged to add a received error signal (q) to the second new values of the media content (x_E) for providing at least essentially lossless media content.

- 5 27. System of devices that can communicate with each other comprising:
a device (10) providing additional information (O, D) in a signal (y) having media content, comprising:
a first mapping unit (14) arranged to map the amplitude values of the media content onto first new values using a first mapping function (C_q), and
10 a multiplexing unit (16) for inserting the additional information into the mapped media content, and
a device (12) for receiving additional information (O, D) in a signal (y) having media content, comprising:
a demultiplexing unit (22) arranged to receive a signal including media content
15 (x_Q) the amplitude values of which have been mapped onto first new values using said first mapping function (C_q) together with additional embedded information (O, D), and remove the additional information from the media content.

28. Signal ($y(n)$) comprising media content ($x_Q(n)$) with embedded additional
20 information ($O;D$), where the amplitude values of the media content have been mapped onto first new values using a first mapping function (C_q), such that the additional information can be retrieved from the mapped media content.